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ABSTRACT

Five investigations sponsored by the Office of Research and Evaluation (ORE) of the Model Secondary School for the Deaf (MSSD) are reported. Presented first are results of a national survey (April 1974) of media equipment in 123 residential and day programs for the hearing impaired, in which the number of cassette video recorders and color video monitors was found to be increasing the most. The second report is an evaluation of the Computer Assisted Instruction Mathematics Strands Curriculum, based on its use (1971-73) with 86 students at MSSD whose achievement on the Strands did not relate significantly to achievement on the Stanford Achievement Test math subtest. The third article consists of four suggestions (such as specifying objectives) to aid teachers in developing student attitude questionnaires. A manual which ORE has utilized to collect teacher generated data during formative evaluation of MSSD projects is provided. Reported last is a formative evaluation (1973) of an in-house developed unit of General Art II which, when used to teach six basic terms describing texture to a sample group of eight MSSD students, resulted in all Ss attaining 100 percent level of accuracy on cognitive posttests. (LS)

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A NATIONAL SURVEY OF CURRENT AND ANTICIPATED MEDIA EQUIPMENT IN RESIDENTIAL AND DAY PROGRAMS FOR THE HEARING IMPAIRED

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Office of Research and Evaluation

Model Secondary School for the Deaf

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Washington, D. C. 20002

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INTRODUCTION

In compliance with Public Law 89-694, an agreement between the Department of Health, Education, and Welfare and Gallaudet College was signed on May 16, 1969, authorizing the establishment, construction, equipping, and operation of a Model Secondary School for the Deaf (MSSD).

The legislative mandate reflected within the Public Law assigns the MSSD the interrelated goals of: (a) serving as a laboratory for educational and instructional models; (b) disseminating working models throughout the field of education of the deaf in order to have an impact upon the education of more than 60,000 deaf students in schools and programs, their parents, and the 10,000 professional persons in education of the deaf and related disciplines; (c) preparing deaf adolescents for post-secondary academic and/or vocational pursuits; and, (d) providing deaf adolescents the skills necessary to become effective members of society. The first two goals relate to the national scope of the MSSD, while the latter two goals relate to the instructional program of the MSSD.

The Office of Research and Evaluation (ORE) of the MSSD has compiled this Occasional Paper which illustrates the diversity of the current investigations of the ORE. These investigation were undertaken to satisfy both the national and immediate goals of the MSSD.

The papers were specifically selected for their differences rather than their similarities. We are thus hopeful that sufficient interest may be generated that mutually beneficial dialogue will result from the sharing of this information.

Joseph Rosenstein, Ph.D.
Director
Office of Research and Evaluation
July, 1974

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ABSTRACT

This report represents a mail survey of 123 programs for the hearing impaired. The current availability of 30 specific items of media equipment was determined. The anticipated acquisitions by the programs of these same items over the next three years was determined. The largest indicated area of growth is in the acquisition of cassette video recorders and color video monitors. These two items were among the least frequently reported as currently available.

The range of availability is shown in that 80% of the reporting programs have thermofax transparency projectors while 9% have 16 cartridge projectors.

One of the components of the Model Secondary School for the Deaf (MSSD) involves the development of instructional materials and the selection and/or production of appropriate support media. In order to select or develop mediated instructional materials which can and will be used by educational programs for the deaf, MSSD needed to determine the current and projected media capabilities of schools for the hearing impaired.

The Office of Research and Evaluation (ORE) of MSSD conducted a mail survey of 165 residential and day programs for the hearing impaired. Programs which were identified as public school class programs were not included in the sample as these programs are not the major consumer population of MSSD product development efforts. Public school programs were also more likely to have available, either directly or through a school system loan basis, media equipment and materials. Responses were received from 123 programs, a 71.3% return. These programs educate approximately 23,000 students.

Of the 123 schools, two educating residential students only, 58 having day programs only and 52 combined residential and day programs responded to the survey. Eleven other programs returned the survey but did not specify type of school.

Of particular interest to the MSSD were the 73, or 59.3%, of the responding schools which had a secondary program. Forty-three schools, 35.0%, indicated "other" as a type of program. This was often further specified as vocational programs. The responding programs indicated a total of 9,513 students age 13 and older enrolled. Students from

7 to 12 years of age were enrolled in 113 programs and accounted for 791 hearing impaired students. In the 0-6 year age range, 112 schools had a total of 2,768 students.

Residential Only Schools[1]

Responses from the two residential only schools indicated that neither school had 16 mm cartridge projectors, color video monitors, cassette video recorders, 35 mm cameras, diazo transparency producers, photocopiers or cable TV systems.

Both schools had at least one 16 mm reel to reel projector, cassette audio recorder, 2 x 2 slide projector, carousel slide projector, instamatic camera, S8 movie camera, and thermofax transparency producer. One of the two schools has at least one of the remaining media items which were listed on the Media Questionnaire.

Anticipated acquisitions were analyzed in terms of current levels of availability. For example, neither of these two schools had 16 mm cartridge projectors at the time of the survey and neither intended to acquire any within the next three years. Of the seven surveyed media items not currently available to either school only one item, a cassette video recorder, is an anticipated acquisition in the next three years.

Currently available items which neither school planned to add to present resources are film and slide projectors, still cameras, overhead transparency producers, photocopiers and cable TV.

Day Only Programs

At least 80% (or 47 schools) of the responding Day Only Schools did not currently have the following media equipment available for students: 16 mm cartridge projectors, S8 sound projectors, color video monitors, cassette video recorders, 16 mm movie cameras, diazo transparency makers, and cable TV systems. At least 80% (47 schools or more) had at least one 16 mm reel to reel projector and at least one thermofax transparency producer.

Of the 47 (80%) or more schools which did not have at least one of the media items noted above, at least one of the schools intends to acquire some of these equipment items within the next three years. Three schools intend to acquire 16 mm cartridge projectors, and two expect to have S8 sound projectors available within three years. Eight schools which currently have no color video monitors expect to acquire at least one, and seven schools expect to acquire cassette video recorders. Only one school which does not currently have a 16 mm movie camera intends to acquire one. Three schools intend to have diazo transparency producers available in their school in three years, and four schools plan cable TV systems.

Combined (Day and Residential) Schools

Of the 52 responding schools which have both Residential and Day Programs, at least 80% (42 or more schools) have at least one

35 mm filmstrip projector, overhead projector and projector screen. At least 80% of these schools did not have any 16 mm cartridge projectors and cassette video recorders.

A summary of the expected acquisition of media resources over the next three year period for schools with both residential and day class programs by current level of resource availability was prepared. Every item on the media resource list was an anticipated acquisition by at least one of the schools with both day and residential programs. At least twenty of the 52 schools intend to acquire the following items: 16 mm reel to reel projectors; casssette audio recorders; color video monitors; video cameras; carousel projectors, polaroid cameras; and instamatic cameras.

Total Material Availability

Items most frequently found in the reporting programs were: thermofax transparency producers (80.3% of the programs), overhead projectors (74.6%), polaroid cameras and reel-reel audio recorders (both 73.7%), carousel projectors (72.1%), and cassette audio recorders (68.7%).

Items least frequently found were cable TV systems (31.2%), color video monitors (29.5%), 16 mm movie cameras (26.2%), cassette video recorders (18.3%) and 16 mm cartridge projectors (9.0%).

One of the largest areas of anticipated growth seems to be occurring in the planned acquisition of video equipment. Approximately 20% more schools will have cassette video recorders within three years and 18% more schools will have color video monitors within three years.

Summary

The data provided by those schools responding to this survey will prove highly useful to the curriculum development efforts as well as research endeavors conducted by The Model Secondary School for the Deaf.

The data provided by this survey can and should be interpreted differently depending upon the needs and objectives of the consumers. The intent of this particular report is primarily to briefly describe the data and summarize the findings.

References

[1]Space limitations preclude inclusion and discussion of all Tables. A complete copy of this report including all Tables may be obtained by writing the authors.

AN EVALUATION OF CAI STRANDS CURRICULUM AT MSSD (1971-72 and 1972-73)

David L. Knight
Office of Research and Evaluation
November, 1973

INTRODUCTION: GENERAL DESCRIPTION OF THE CAI STRANDS CURRICULUM

The CAI Mathematics Strands Curriculum, developed by the Institute for Mathematical Studies in the Social Sciences at Stanford University is a drill and practice program designed "(a) to provide supplementary individualized instruction in elementary mathematics at a level of difficulty appropriate to each student's level of achievement, (b) to a-low acceleration in any concept area in which a student demonstrates proficiency, and to allow repeated drill and practice in areas of deficiency, and (c) to report a daily profile of each student's progress through the curriculum" (Suppes, et. al., 1973, p. 7).

The Strands are mathematical activities with problems of a like nature arranged sequentially with respect to difficulty. The Curriculum offers 14 different Strands ranging in grade placement (GP) level of difficulty from 1.0 years entry to 7.9 years exit. The reader is referred to Suppes, et.al., 1973, for a more detailed description.

Students are generally placed on the Strands at a level equivalent to their grade placement in school. The first ten sessions allow for rapid movement within the Strands until the student's current level of mathematical functioning is established. The program presents problems from all of the Strands the student is working on, in mixed order, during each session.

After initial placement the student advances through the Strands program according to the number of correct or incorrect responses made to the problems previously presented. Each new session picks up where the old session left off. Each student may be working on different Strands at different levels

because movement through the program is individual--independent of the performance of any other student or class. The model of movement through the Strands ". . . is defined so that a student with average performance gains one year's GP in one school year of CAI time which ranges from six to ten minutes per school day." (Suppes, et. al., 1973, p. 11)

The MSSD Strands Curriculum generally operated as described above. The one departure was that Stanford Computation subtest scores were used for initial placement in the program as the MSSD is non-graded. Students carried over the summer were entered in the fall at .5 year lower than they had exited the previous spring.

In addition to GP on individual Strands an Average Grade Placement (AGP) shows the overall position of the student in the program. The AGP is simply a weighted mean GP across all Strands the student is working on.

Another measure of student performance on the Strands reflects the rate of progress for each student. This measure is different from the AGP in that it takes into account the time factor. Therefore a standardized rate number of .10 represents the student who will complete one year of Strands Curriculum in one school year. A figure higher than this would indicate that the student would complete more than one year of Strands Curriculum in one school year and vice versa.

ANALYSES

PRELIMINARY CAUTIONARY NOTE: The analyses reported here were performed ex post facto; that is, no attempt was made prior to the initiation of the CAI Strands Curriculum in 1971 to design an evaluation plan or strategy to test the effectiveness and/or impact of the CAI. Consequently, several areas of

potential analytic interest cannot be pursued because of lack of appropriate data, records, and design.

The data available for analysis included all students who had at one time or another "signed on" the computer, irrespective of their tenure in the Strands. It was decided that students who had not spent sufficient time in the Strands for appreciable achievement to have occurred would be eliminated from the analyses. The criterion adopted was completion of at least 20 sessions in the Strands. Entry level AGP was taken from the first available computer printout after the student had completed ten sessions (inasmuch as the first ten sessions are designed to ascertain the student's actual level of math functioning).

The analyses that follow are for the 1971-72 CAI program and the 1972-73 CAI program, with discussion, conclusion, and recommendation sections following.

1971-72 CAI STRANDS CURRICULUM ANALYSIS

While 85 MSSD students were assigned to the Strands during the 1971-72 school year, 52 students met the criterion for inclusion in this analysis. The entry level AGP was determined at an average of 11.63 sessions. The students showed a mean AGP gain entry to exit of 1.05 years (s=.97). An average of 2389.5 problems (s=1922.4) was completed in a mean number of 61.85 sessions (s=53.46). An extreme is illustrated by one student who finished the entire Strands program with 8733 problems worked in 272 sessions.

The data reported above are extremely varied when the large standard deviations are compared with their respective means. The number of problems completed ranged from 577 to 8733 problems (over 8000 problems). In other words, students within the group approached the program with virtually no consistency of effort.

A significant correlation of .85 (t=[illegible] df=50; significance greater than .001) between number of problems worke[illegible] AGP gain reveals a definite linear relationship between the two. In other words, the more problems a student worked the more he achieved in AGP at exit.

Correlations between AGP gain on the CAI Math Strands and gain scores on the Stanford Achievement Test math subtests were computed to ascertain the relationship, if any, of the CAI Strands program with standardized math achievement subtest scores. We recognize that certain disparity may exist between the scalar units used to report achievement in the CAI program and in the Stanford Achievement Test: while both are expressed in terms of grade level, they may not be totally compatible. In addition, most of the Strands have a ceiling of 7.9 AGP level whereas the Stanford has a ceiling of 12.9 in the Math subtests for the Advanced Battery. Examination of the data, however, reveals that the ceiling effect occurred minimally on the CAI and in itself does not seriously affect the validity of the correlations performed. Nevertheless, a somewhat cautious approach to the interpretation of the correlations reported below is suggested.

Table I below presents the results of the correlations. The results indicate little relationship between achievement in CAI and in Stanford Achievement Test math subtests. One correlation between AGP gain and computation

TABLE I

MATRIX OF CORRELATIONS BETWEEN AGP GAIN
AND GAIN ON SELECTED STANFORD SUBTESTS BY BATTERY LEVEL (71-72)

Stanford Level	Arith. Computation	Arith. Concepts	Arith. Application	N
INT I	-.509	.074	-.096	12
INT II	.123	-.014	-.038	17
ADV	.135	.314	.326	21

gain on the INT I level approaches significance and shows a negative relationship between the two. In this instance there is a trend for better achievers on CAI to be poorer achievers on the Computation Subtest.

One would logically expect a high correlation between the CAI AGP gain and Arithmetic Computation because both are primarily computational in nature. However, the results did not bear this expectation out. Even more perplexing was the negative relationship for the Intermediate I group.

Spearman rank (non-parametric) correlations were computed on AGP gain and Computation gain because of suspected non-normal distributions of the gain scores attributable to the relatively small Ns and extreme variability mentioned previously. Hence, if the non-parametric correlations approximated the parametric correlations one could assume that the normal distribution assumption underlying the use of parametric correlations was not unduly violated.

The results of this comparison are presented in Table II. There is considerable disparity in the INT I comparison between parametric and non-parametric measures. This lends credence to the suspicion that the INT I gain scores were not normally distributed and the parametric correlation was spurious.

TABLE II

COMPARISON OF PARAMETRIC AND NON-PARAMETRIC CORRELATION COEFFICIENTS BETWEEN AGP GAIN AND ARITHMETIC COMPUTATION GAIN BY STANFORD BATTERY LEVEL 1971-72

Stanford Battery	r	r_s	N
INT I	-.509	-.030	12
INT II	.123	.161	17
ADV	.135	.204	21

The INT II and ADV comparisons show the non-parametric correlations representing slightly stronger but still non-significant relationships. Differences existing between the parametric and non-parametric coefficients here are not large enough to cause serious concern over the normalcy of the data at the INT II and ADV levels.

An additional comparison was made between the Stanford gain scores of students meeting the criterion for inclusion in the analysis and those who did not, in order to shed some light on the lack of relationship between the CAI Strands achievement and Stanford achievement. Hence, Stanford gains are compared for the CAI and a non-CAI group, even though some students in the non-CAI group did have minimal exposure to the Strands (less than 20 sessions completed).

TABLE III

A COMPARISON OF ACHIEVEMENT ON STANFORD MATH SUBTESTS OF STUDENTS INCLUDED AND STUDENTS NOT INCLUDED IN THE CAI STRANDS AT MSSD 1971-72

STANFORD BATTERY		ARITH. COMPUTATION			ARITH. CONCEPTS			ARITH. APPLICATION		
		CAI	NON-CAI	MEAN DIFF.	CAI	NON-CAI	MEAN DIFF.	CAI	NON-CAI	MEAN DIFF.
INT I	$\bar{X}$	.72	.24	.48	.91	1.12	-.21	.59	.22	.37
	s	.56	.63		.63	.91		.77	.54	
	N	12	11		12	11		12	11	
INT II	$\bar{X}$	1.41	1.08	.33	.16	.23	-.07	1.14	.38	.76*
	s	1.07	1.56		.70	.83		1.17	.54	
	N	15	12		15	12		15	12	
ADV	$\bar{X}$	1.02	.40	.62	.51	.30	.21	.69	-.12	.81*
	s	1.34	.79		1.22	.88		1.01	.86	
	N	21	11		21	11		21	11	

*Significance greater than .05 (t tests for significance of the difference between means).

Table III reports the comparative results. No control over any variable other than inclusion or non-inclusion in CAI Strands was possible. That is,

other factors could have incluenced performance on the Stanford subtests in addition to the influence of the CAI program. Consequently, caution should be used in interpreting the results in Table III.

Examination of Table III shows the CAI group exhibiting greater achievement in seven of the nine possible comparisons. While only two of the comparisons showed a significant difference it is interesting to note that the trend favored the CAI group in terms of greater achievement on the Stanford Math subtests. This is somewhat surprising as it was earlier reported that the gains in achievement on CAI were not related to gains on the Stanford.

A correlation between AGP gain and number of units completed on the Individualized Mathematics Systems (IMS) proved to be non-significant ($r=.214$; $t=1.43$; $df=42$). In other words, gain achieved on the CAI Strands was largely independent of gains achieved on the IMS, which is somewhat surprising considering that the Strands is essentially a drill and practice program.

1972-73 CAI STRANDS CURRICULUM ANALYSES

Out of 57 students assigned to the computer program, 34 met the criterion for inclusion in the analyses. The entry level AGP was recorded, on the average, at 12.35 sessions completed. These students showed a mean AGP gain of .81 years ($s=72$) over all Strands. The students worked an average of 1272.67 problems ($s=997.75$) in an average of 65.91 sessions ($s=45.98$). One student completed the Strands in 159 sessions with 3758 problems worked. As with the 1971-72 analyses, the data were extremely scattered as shown by the large standard deviations relative to the means. The correlation between the number of problems worked and CAI AGP gain was .87, significant beyond the .01 level of confidence ($t=9.92$; $df=32$). Correlations between CAI AGP gain

and Stanford Achievement math subtest gains are presented in Table IV.

TABLE IV

MATRIX OF CORRELATIONS BETWEEN AGP GAIN AND GAIN ON SELECTED STANFORD SUBTESTS BY STANFORD BATTERY

Stanford Battery	Arith. Computation	Arith. Concepts	Arith. Application	N
INT I	.273	.266	.417	9
INT II	-.522	.107	-.227	10
ADV	.367	.217	.333	15

No significant relationships between AGP gain and the Stanford subtests were obtained. The negative non-significant correlation for the INT II Computation subtest which approaches significance is surprising in view of what might logically be expected.

As with the 1971-72 analyses, the normalcy of the distributions was questioned because of the relatively small Ns and the wide scatter of the data. Consequently, non-parametric correlations were computed on the Computation subtest, compared with the parametric measures, and are presented in Table V.

TABLE V

COMPARISON OF PARAMETRIC AND NON-PARAMETRIC CORRELATION COEFFICIENTS BETWEEN AGP GAIN AND ARITHMETIC COMPUTATION GAIN BY STANFORD BATTERY 1972-73

Stanford Battery	r	r_s	N
INT I	.273	.150	9
INT II	-.522	-.538	10
ADV	.367	.408	15

Generally, the parametric correlations are supported by the non-parametric measures. The comparison for INT I would raise some doubts as to the normalcy

of the distribution. It is interesting to note that the strong negative correlation was non-parametrically supported here, whereas it was not for the 1971-72 analyses.

The comparison between Stanford Math achievement subtest gains of CAI vs. non-CAI MSSD students was completed, with the same criteria and cautions mentioned for the 1971-72 analyses. These results are shown in Table VI

TABLE VI

COMPARISON OF ACHIEVEMENT ON STANFORD MATH SUBTESTS BETWEEN STUDENTS INCLUDED AND NOT INCLUDED IN THE CAI STRANDS AT MSSD 1972-73

STANFORD BATTERY		ARITH. COMPUTATION			ARITH. CONCEPTS			ARITH. APPLICATION		
		CAI	NON-CAI	MEAN DIFF.	CAI	NON-CAI	MEAN DIFF.	CAI	NON-CAI	MEAN DIFF.
INT I	$\bar{X}$	-.09	.11	-.20	.12	.16	-.04	.32	.82	-.50
	s	1.07	.70		1.35	1.11		1.23	.93	
	N	9	17		9	17		9	17	
INT II	$\bar{X}$	.69	.45	.24	.26	.89	-.63*	1.19	1.19	0
	s	1.21	1.03		.58	.94		1.14	.66	
	N	10	15		10	15		10	15	
ADV	$\bar{X}$	1.21	1.17	.04	.83	.83	0	.28	.73	-.45
	s	1.11	1.24		1.38	1.27		1.08	1.70	
	N	15	19		15	19		15	19	

*Significance greater than .05 level, t test of significance of the difference between means.

Examination of Table VI shows the CAI group having greater achievement in two comparisons, the non-CAI group having greater achievement in five comparisons, and both groups equal in two others. This differs from the comparisons reported for the 1971-72 groups (where seven of the nine comparisons favored the CAI group in terms of greater achievement). One significant difference was shown in favor of the non-CAI group on the Concepts subtest for INT II.

A significant correlation of .55 ($t=3.09$; $df=22$; significance of t greater than .01) was found to exist between AGP gain and number of units completed

IMS. A Spearman rank correlation was computed to substantiate the significant relationship since nonsignificance was noted for the same comparison in the 1971-72 analyses. The resultant rank order correlation was .224 (t=1.19; df=22; non-significant) and did not substantiate the parametric correlation.

DISCUSSION

COMPARATIVE GAINS AND ACHIEVEMENT:

Comparison of certain results reflect the relative effort expended by the students in each year of the Strands program at MSSD. In terms of effort, the 1971-72 group showed a mean of 2389.5 problems worked in an average of 1272.7 problems in a mean of 65.91 sessions. In other words, the 1972-73 group required a few more sessions to work approximately half the number of problems than did the 1971-72 group.

The fact that the 1971-72 group gained more than did the 1972-73 group is not surprising due to the strong relationship noted between problems worked and AGP gain. However, the mean difference in AGP gain of .24 years between the groups was statistically non-significant (t=1.30; df=32) which indicates that the difference between groups could be attributed to chance factors independent of the Strands. Referring to the strong correlations reported for both groups between problems worked and AGP gain, one would expect that the mean AGP difference would be greater because of the larger number of problems worked by the 1971-72 group. The fact that it was not greater suggests that while the 1972-73 group was less efficient in terms of effort it was more efficient in terms of learning: less problems worked to produce a comparable gain in AGP.

The lack of a greater difference in AGP gain cannot be attributed to

differences in the groups' entry achievement level, AGP or Stanford Computation subtest. The two groups did not differ significantly in terms of entry and exit achievement on Arithmetic Computation although the 1972-73 group showed slightly greater achievement on both. The mean score entry level (across all Batteries) for the 1972-73 group was 6.25 years (s=1.96) compared with the mean of the 1971-72 group, 5.88 years (s=1.57). Similarly, the 1972-73 group's mean exit level was 7.08 years (s=1.96) and that for the 1971-72 group was 6.95 (s=1.96). In addition, there was no significant difference between the groups on entry AGP level as the 1971-72 group mean entry AGP level was 4.31 years (s=1.22) and the 1972-73 mean was 4.29 years (s=1.52). It is possible that the lack of a significant AGP difference between the groups might be explained as a function of selective factors operating within the 1972-73 group. That is, the 1972-73 group through some selective process was more amenable to the Strands approach to learning, and thereby, was better able to make use of the drill provided by the problems in terms of AGP gain.

Another possible explanation is that the relationship between problems worked and AGP gain, though strong, was not strictly linear. In other words, after having completed a certain number of problems, the learning efficiency of the student decreased, analogous to having reached a saturation point. It might be that the 1971-72 group had reached or passed this point, while the 1972-73 group had not. It cannot be ascertained, however, if this would be a function of the Strands program itself, or of the learning style of the students in each group.

The lack of significant positive relationships between AGP gain and achievement on the Stanford math subtests, particularly the Arithmetic

Computation subtests is both surprising and disturbing. There should be a strong relationship between the two since both are primarily computational in nature. The fact that the data reveal essentially no relationships between the two indicates that they were operating independently of each other: gain in AGP did not relate to gain in Stanford achievement.

There are a number of interpretations for the lack of relationship. The Strands reports student progress in terms of AGP, computed internally by the California-housed computer. The computation is based on the assumption that an average student working an average amount of time on the Strands will achieve a one-year's gain (AGP) in one academic year. This is a model of assumed student performance and is not based on actual student performance in a normative sense. The Stanford Achievement Test, however, reports achievement based on normative samples of normal mainly middle-class constituents.

Thus, the bases used to report achievement are different for each measure of math achievement and, furthermore, hearing-impairment was not taken into account in either measure. Thus the lack of a significant relationship could be a function of the measures used to report achievement.

Another interpretation is that achievement in the Strands may not transfer to the paper-and-pencil computational skills required in the Arithmetic Computation subtest. That is, gains in AGP are meaningful only in terms of the computer structure and do not readily transfer to other situations. The available literature in this area does not treat transfer of training. Suppes, et. al., (1973) do not report on findings in this area even though data similar to those reported here were gathered during their evaluation. In addition, the Strands uses a generally analytic approach to improving math

skills. The analytic approach could be inappropriate for hearing-impaired students and could partially account for the non-transference of learning.

Turning attention to comparisons of CAI and non-CAI groups, the 1971-72 CAI group appeared to achieve greater than did the non-CAI group (Stanford Batteries). The opposite was true for the 1972-73 comparison groups. If the 1971-72 trend occurred in the 1972-73 comparisons, one would suspect that CAI had an effect on achievement on the Stanford, even though most of the comparisons were non-significant. The trend was not maintained, however, and we are left with the interpretation that the comparative differences were due to random factors.

The strong significant correlations reported between problems worked and AGP gain for both the 1971-72 and 1972-73 groups are within expectations. In simple terms, the strong tendency for students working comparatively large numbers of problems to show comparatively large gains (and vice versa) is a logical outcome considering the internally computed means of recording achievement on the Strands.

STRANDS AND IMS:

One point to be discussed is the relationship at MSSD between the IMS and the supplemental drill and practice Strands. For the 1971-72 group, a non-significant relationship was noted between gain on the IMS (in terms of units completed) and AGP gain on the Strands; and a questionably significant relationship for the 1972-73 group. The 1972-73 group showed a significant parametric correlation of .55 between achievement on the IMS and on Strands but the non-parametric correlation on the same data proved to be non-significant (r_s = .224). As noted earlier, the parametric correlation is suspected of being spurious.

There are, however, several considerations that must be taken into account. The means of recording achievement in the IMS and Strands may not be compatible. The IMS has no means of reporting achievement other than progress through the system in terms of units (cells) completed. Here again, the lack of significant relationships could be explained as a function of the measures used to report achievement.

Another consideration regards the usage of Strands in relationship to the IMS at MSSD. Even though a student may be placed in a particular strand or level within the Strands program, the IMS and Strands were essentially non-coordinated, programmatically, throughout the two years being reported on. This means that a student working on horizontal addition in IMS would by change only be working on the horizontal addition Strand or vice versa. Similarly, a student experiencing difficulty in fractions would by chance only be receiving remedial assistance from the fractions Strand and then mexed with problems from other Strands the student was eligible for.

This programmatic consideration poses serious implications for determining the effect the Strands had as a supplimental drill and practice program. A strong relationship would not be expected between the two programs, inasmuch as they were functioning virtually independently of each other.

The independence of the two programs, however, should not influence the relationship between AGP and Stanford gain in achievement. There should be a relationship between gain in the Strands and gain on a paper and pencil test of computation. The fact that no significant relationships were noted, and moreover, that the correlations of greatest magnitude were negative, strongly indicates that the use of the Strands program at MSSD be seriously

questioned.

CONCLUSIONS

The following conclusions are based on the preceding findings and discussion:

1. Achievement (AGP gain) on the Strands did not relate significantly to achievement on the Stanford math subtests for both the 1971-72 and 1972-73 groups.

2. Achievement (AGP gain) on the Strands did not relate significantly to achievement (numbers of units completed) on IMS in the 1971-72 group nor in the 1972-73 group (non-parametrically). The Strands appear not to be amenable to remediative coordination with IMS.

3. Differences in Stanford math subtest achievement between CAI and non-CAI groups for both academic years reported were attributable to uncontrolled variables and did not reveal superiority of achievement in either group.

4. Positive transfer of learning from the Strands to paper and pencil computation (achievement) did not occur at MSSD and in two cases showed a negative relationship.

5. The value of the Strands used as a supplemental drill and practice program at MSSD cannot be determined because of the lack of programmatic coordination between IMS and Strands.

RECOMMENDATIONS

The conclusions drawn from the analyses and findings do not purport to be exhaustive, and some interpretations are subject to further exploration. Alternative explanations could be proffered to substantiate or refute the conclusions. A well-designed and implemented evaluation/research effort could have provided a more definitive report that conceivably would shed light on some of the attendant unanswered questions raised in this report.

It is thereby recommended that:

1. No further expenditure of funds or effort be directed towards maintenance of the CAI until a definitive and exhaustive educational/reseach/evaluation design can be implemented to determine the effectiveness of the CAI at MSSD.

2. That no project or undertaking, particularly one of the magnitude of the CAI, be implemented without proper research, evaluation and design consultation and input.

1. Suppes, P., Goldberg, A., Kanz, G., Searle, B., and Stauffer, G. Teacher's Handbook for CAI Courses, Technical Report No. 178, Psychology and Education Series, Institute for Mathematical Studies in the Social Sciences, Stanford University, Stanford, California, September 1, 1971.

2. Suppes, P., Fletcher, J. D., Zanotti, M., Lorton, P. V. Jr., and Searle, B. W. Evaluation of Computer-Assisted Instruction in Elementary Mathematics for Hearing-Impaired Students, Technical Report No. 200, Psychology and Education Series, Institute for Mathematical Studies in the Social Sciences, Stanford University, Stanford, California, March 17, 1973.

SUGGESTIONS FOR DEVELOPING QUESTIONNAIRES

PREPARED BY: NORMA CLARK
NOVEMBER, 1973

Teachers often wish to obtain feedback from students in the form of opinion or attitude questionnaires. Developing a really good questionnaire which validly and reliably meets an assessment objective is a long process. Usually, however, teachers developing a questionnaire for classroom use have just one or two objectives in mind and may only plan to use the questionnaire once or twice. A complicated process of development and validation in these cases is not justified, though it is necessary to follow a few basic principles to assure that the results of the questionnaire really meet the objectives which the teacher has in mind.

The following four-step procedure incorporates the basic principles of questionnaire design and may be helpful to those who plan to use "home-made" questionnaires in their classrooms. The four steps include specification of objectives, generation of general questions, selection of relevant formats, and writing of items.

STEP I: SPECIFY YOUR OBJECTIVES

For most classroom purposes, questionnaires are intended to meet only one or two teacher objectives. Before plunging into writing individual items, keep in mind exactly how you intend to use the results of the questionnaire. For illustrative purposes, let's suppose that the objective of a prospective questionnaire is to assist the teacher in deciding which of many available social studies films to order for a future social studies unit. Thus in this case: The purpose of the questionnaire will be to provide the teacher

with information about the interests and preferences of students.

STEP II: GENERATE GENERAL QUESTIONS

Once the objectives of the questionnaire are specified, begin to consider what general kinds of information would meet each objective. For the example cited above, these two questions might be relevant:

1. What social studies films have the students liked so far?
2. What aspects of the social studies films already seen by students have they found most appealing?

STEP III: SELECT RELEVANT QUESTION FORMATS

The kinds of information required to meet an objective will determine the number and types of question formats to be used in a questionnaire. An important consideration in selection of formats is the age, ability or sophistication of the persons who will be answering the questionnaire. Try to select a format which provides the kind of information (e.g. evaluative, comparative, attitudinal), yet can be easily comprehended by the persons who must respond to the questions.

Descriptions of several basic formats and examples of the uses of each are provided below:

"On-off" Formats: This format consists of a statement or question to which the respondent must select one of two response options, such as yes or no, true or false, and agree or disagree. This is perhaps the simplest, most direct of all formats and requires very little sophistication in judgement on the part of respondents. This very attribute of simplicity does however, limit the quality of the information in that the response options

do not provide for partial agreements or qualified answers.

To obtain evaluative information this "of-off" format can be used as in:

Example 1: Huckleberry Finn was a good novel. T F

or for attitudinal information as in:

Example 2: Did you like the novel Huckleberry Finn? Y N

or for comparative information as in:

Example 3: Huckleberry Finn was a better novel than the Badge of Courage.....

Agree Disagree

Likert or Scaled Formats: This format is similar to the "on-off" formats, but instead of two responses options, the respondent must select from options along a dimension. Typically three, five or seven gradations or options are delineated. The use of more than seven options is cumbersome to summarize and requires respondents to make very subtle discriminations.

Response options for the Likert or scaled format can be developed for any characteristic which can be dimensionalized. Common response dimensions are Agree - Disagree (e.g. Completely Agree, Somewhat agree, Undecided, Somewhat disagree, Completely disagree), Like - Dislike, True - False, and Good - Bad. This format requires more sophistication on the part of the respondent but has the advantage of providing for gradations in opinion. (This is a difficult task for a majority of our students). The Likert or scaled format can be employed to provide evaluative information as in:

Example 4: I think the novel Huckleberry Finn was

Very Exciting/Pretty Exciting/So-So/Pretty Boring/Very Boring/

or for comparative information as in:

Example 5: The novel Huckleberry Finn was better than the Badge of Courage.

Completely Agree	Mostly Agree	Undecided	Mostly Disagree	Completely Disagree
/	/	/	/	/

or attitudinal information as in:

Example 6: I find it easy to talk with my classmates.

Completely True	Mostly True	Somewhat True Somewhat False	Mostly False	Completely False
/	/	/	/	/

Multiple Choice Format: The multiple choice format is useful when the objective is to determine which of several ideas, events or items is preferred by the respondent. This format is often employed in attitude surveys to determine which of several response statements (i.e. response options) best describes the respondent's own feelings. Two examples of uses of this format are:

Example 7: The best part about the novel Huckleberry Finn was:

a. it was funny
b. it was exciting
c. it was short
d. it was easy to read

Example 8: If your parents told you that you should try to do better in school, why do you think they would do that?

a. because they were grumpy that day
b. because your grades should be higher

Ranking Format: The ranking format is useful when the objective is to determine respondents order of preference among several alternatives. While

other formats can be used to infer this, the ranking format directly asks the respondent to provide the information. The ranking format is a very straightforward technique when comparative information is desired. If, however, a large array of alternatives (e.g. more than 10) are to be ranked, respondents may have difficulty with the ranking procedure and another format, though indirect, would probably be more reliable.

An example of the ranking format is:

Example 9: Please rank (number) the following class activities from what you think is most enjoyable (a rank of "1") to least enjoyable (a rank of "5"). Place the number of the rank you select on the line for each activity.

_____a. Playing word games with a group of students

_____b. Planning puppet shows

_____c. Seeing movies

_____d. Performing in skits

_____e. Going on field trips

(NOTE: We find that in an intended questionnaire for the entire MSSD student population, ranking is a difficult task).

STEP IV: WRITE QUESTIONNAIRE ITEMS

In writing items for opinion or attitude surveys, care should be taken to assure that response options are consistent with the question being asked. For example, if you ask a question with the stem "How much time do you...." then the response options, Very often, Sometimes, and Never are inconsistent. Instead, the options might be, A lot, Some, and None in order to be consistent with the question.

A second important consideration is clarity. A common error in writing items is the assumption that the respondent will correctly infer what is intended by one item from a previous item. Try to write each item as if it were going to be the only one in the questionnaire.

A third consideration in questionnaire writing is possible response bias on the part of respondents. Response bias is the tendency for a respondent to answer questions in a pattern which does not accurately reflect his own opinion or attitude. For example many persons tend to answer questions in a manner which they consider socially acceptable, or which creates a favorably impression. For this reason, try to be objective in your question-writing. Do not load the questionnaire with an imbalance of positive or negatively-worded items, unless your purpose dictates otherwise. Whenever possible assurances should be given that answers will be anonymous or will not affect grades, job selection, etc. Do not, however, give false assurances or you will create an insurmountable credibility gap.

Another response tendency is for respondents to select the same response option for each item. Often the option will be a noncommittal or middle of the road option. Whenever feasible, a careful, though not necessarily detailed, explanation of the importance of the questionnaire will usually encourage people to respond thoughtfully and honestly.

Another important aspect of questionnaire writing is the preparation of careful instructions for each group of items with the same question format. Do not assume, for example, that they are to circle their selected response option - Tell them. Clear instructions maximize the possibility that all respondents will use the same procedures to complete the questionnaire. The choice among circling a word, putting an X in a box, checking a blank line, or

filling in blanks with words at the end of a sentence (given a list to choose from); for deaf populations, should be made on the basis of the anticipated level of sophistication of the target (or intended) group with which the questionnaire will be used.

We hope these suggestions are helpful to you. Once you have developed your items, staff of ORE will be happy to assist you in checking over the questionnaire that you plan to use. If you encounter difficulties, please don't hesitate to contact us.

EVALUATION MANUAL: A SCHEME FOR COLLECTING TEACHER GENERATED DATA DURING FORMATIVE EVALUATION PROJECTS AT THE MSSD.

The manual on the following pages arose from a need to systematize data collected from participating teachers during evaluation of projects undergoing development. The format presented is by no means meant to be appropriate for every developmental situation. Some of the techniques may prove to be useful in specific settings.

The ORE has utilized the manual and has found it very helpful. Teachers report that it is easy to use and does provide them with information both valuable and usable.

Evaluation Manual

PARTICIPATING TEACHER'S

EVALUATION MANUAL

FOR

_____

_____

_____

Model Secondary School for the Deaf

Produced with funds from the U.S. Department of Health, Education and Welfare. P.L. 89-694.

INTRODUCTION

You are about to participate in an evaluation of materials for the classroom teacher. The materials to be evaluated are still in a formative stage, subject to change. They have not been previously tested nor revised in a formal sense. They are now ready for Pilot Testing in a classroom, before further revising and polishing.

These instructional materials were developed under the direction of a person very much like yourself. Now we are collecting data to be used in rewriting and restructuring the materials on the basis of use by teachers in various settings. Although the information you are being asked to gather may be quite different from that which you usually record, remember that it is very important to the further improvements of the materials.

Please do not copy the materials you are testing. When a final version is ready, a set of the materials will be sent to your program.

CAUTION:

You may find that pressures and demands of your teaching position may tempt you to spend less time in gathering and recording information on these materials. If you are so tempted, please remember that you are the sole source of information on the workings of these materials in your classroom. This information is vital as only a few classrooms are pilot-testing these materials. The more information you provide, the more total information there will be to work with in the final version.

We realize that the materials may not work well with some students, and we need to know the details of your experience with them. Please, therefore, put your energies into recording your criticisms of the materials openly and candidly.

...we do appreciate the fact that the present demands upon you are very heavy - but the goal is vitally important!

RATIONALE:

Your participation in the pilot-testing and evaluation of these new instructional materials is very important. You are being asked:

1. to determine the success of each learning activity in relation to each student. (Can the student perform the cognitive tasks?);
2. to determine what problems arise in using the materials (Are the materials suitable for your teaching situation? Do the students find them too hard, too easy, boring, etc.?);
3. to assess affective, cognitive, and psychomotor changes in each student's behavior during instruction (What can he do when he has completed the materials as compared with what he could do before instruction began?).

WHAT INFORMATION WILL YOU GATHER?

You and/or your students will be asked to make the following types of assessments during the evaluation of the instructional materials (forms will be provided for you to use):

1. Subjective evaluation of the success of each activity through teacher reports, student performance, records, questionnaires.*
2. Objective evaluation of changes in skills, attitudes and knowledge by unit tests, general tests, performance in tasks, interviews.
3. Description of the process and conditions of the instruction by specification of the setting, perceptions of students, ratings by teachers and students.

*Observer reports (by others) may be added here.

USING YOUR INFORMATION-GATHERING TOOLS

Booklets: You will have a copy of each instructional booklet that the student will use. Please write directly on your booklets.

Make marginal notes beside each specific activity describing the students' reactions and/or your reactions to the activity. If, for example, a student asks you to explain a word in one of the booklets, circle that word in your unit copy and note what you did to overcome the lack of understanding. Tally other students' difficulties with that word, if necessary.

Be frank about whether a particular activity was good, bad or mediocre - and interesting, boring or blah.

Remember that criticisms are important, and that the more you write, the more helpful you will be.

Student Folders: Keep all student materials in individual folders, in one easily accessible place.

Do not permit the students to use the materials outside of class; be sure the students return the materials at the end of each class period, unless specifically indicated by the activity in the booklet.

Be certain each student records his attendance, his tardiness (if any), and the Unit-Activity he worked on for that day. STUDENT DAILY LOGS are in individual folders for that purpose.

You will be given two files, one for WORK IN PROGRESS and one for WORK COMPLETED, with an individual folder for each student in each file.

A simple rule to remember is to collect everything each day. We are asking that all materials be returned to MSSD evaluators when you and your students have completed the materials.

Tests: Each unit begins with a pre-test. Students who meet the criteria specified for passing the scored pre-test may move directly to the following unit and its pre-test.

When a student is ready for a unit post-test, collect all of the material he has been working on and put the material in the student's WORK COMPLETED file. If the student does not pass the test, file it and then recycle him through the materials; collect all of the material again; mark them "second try" and file them; give him a new copy of the post-test (mark it "second try").

If you find that you must coach on a test you MUST NOT give any hint as to the right answer, AND you must note the fact of coaching on the back of the student's test with a brief explanation of why the coaching was needed, and what was said to help the student understand the question.

Diary Sheets: Start a daily log. This will supplement your entries in the individual teacher Unit booklets.

Note those activities and reactions that you perceive to be a particularly unusual and/or unique.

Note anything which may indicate affective comments, attitudes, or changes in the class. (For example: The class was really "up" today - much discussion on this group activity generated; or, "More kids are helping each other today than did yesterday.")

Much useful information is gathered when a participating teacher notes those things which did not work and his assessments of why they did not

work. Your diary sheet should include daily statements which indicate degree of interest expressed by students as to what is happening in class, together with any other comments you feel we should consider for final revisions.

SUMMARY OF WHAT YOU SHOULD DO DAILY

These activities should be completed daily:

--- make notes on your copy of student booklets

--- circle words students are having problems with

--- collect & file all materials from students

--- make sure that students have completed their own daily records

--- collect, and grade and record tests (if given)

--- complete daily diary sheets

--- complete activity check list for each activity

--- complete other evaluation forms as necessary

STUDENT DAILY LOG

Student name: _____

Date	Time to Class	Time Left Class	What I Did

Activity Check List (Sample)

IP_____ Activity_____ Date_____

Additional comments may be made on back

1. Your rating of this activity (High) 1 2 3 4 5 (Low)

2. These materials were used

	Worth-while	Revise Slightly	Revise	Worth-less
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

3. Do you feel that the activity supports the objective?

_____yes _____no

4. Were the teacher directions clear enough? _____yes _____no

5. Maturity Level? _____Just Right _____Too Childish _____Too

6. Mature.

6. Vocabulary Level? ____Just Right _____Too Easy _____Too difficult.

7. Teacher-Provided Material? _____Easy to Get ____Hard to get, but worth it _____unobtainable.

8. Student Interest Level? _____High _____Moderate ____Indifferent _____Low _____Strongly Disliked ____Can't Rate Because _____

_____

_____

Remember to add your comments on the back.

Daily Diary Sheet (Sample)

Date _____

Thank you very much for your time and effort in helping us with this evaluation.

REPORT ON THE FORMATIVE EVALUATION OF THE IDS PROJECT: TEXTURE

WILLIAM D. GRANT
OFFICE OF RESEARCH AND EVALUATION
DECEMBER, 1973

PRODUCED WITH FUNDS FROM THE U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, P.L. 89-694. HOWEVER, THE OPINION OR POLICIES EXPRESSED HEREIN DO NOT NECESSARILY REFLECT THOSE OF THE U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE.

FOREWORD

This is a report of a formative evaluation of the General Art II Unit, Texture. The program was developed by Jay Tucker, Content Specialist, and Jean Fulton, Instructional Design Specialist, under the supervision of James Kearney, Coordinator of Curriculum.

Barbara Petterson, the participative teacher, used the program in the art area of the M.S.S.D. and cheerfully put up with seemingly endless evaluation tasks.

Figure 1 is from materials prepared by Jay Tucker.

Joe Rosenstein and Jim Kearney both gave patient and invaluable editorial assistance.

ABSTRACT

A formative evaluation of an in-house developed unit of General Art II, Texture was undertaken. The unit is designed to lead students to be able to describe the surface quality of real objects using six basic terms of textures. A sample group of eight (8) students completed the program in an average of 9.7 class hours. All students attained 100% level of accuracy on cognitive posttests. The instructional sequence; Student Attitudes Toward the Experience; Participative Teacher Reactions; and, Students' Ability to Perform on a Test of Retention of the Cognitive Information Learned in the Unit are included in the report.

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Instructional Development And Evaluation

Instructional Development is a systematic, logical process for developing validated, practical solutions to instructional problems.

The Model Secondary School for the Deaf (MSSD) coordinates instructional development efforts through an Instructional Development System (IDS).

Evaluation is an intregal part of the IDS. Evaluation occurs at both formative and summative stages of the IDS process. The words "formative evaluation" are used here to mean evaluation at intermediate stages of the process of development. The results of formative evaluation serve as a basis for modifying the product in its formative stages. (Gene V. Glass. "Two generations of evaluation models." Paper presented at Nebraska Personnel and Guidance Association, Lincoln, Nebraska, September, 1968.)

Evaluation in this sense is not, then, "pay-off" evaluation. Rather, the goal is to produce a statement limited to the "goodness" or "badness" of the product itself. It is an analysis of the degree to which assumed interrelationships of the context of the materials, the knowledge of the students, and the experiential effect of their exposure to the product, hold. The goal of such analysis, therefore is to provide information to be used as a basis for modifying the product itself as necessary, in order that the product better reach its stated objectives.

Summative evaluations usually result in determinations for adoption or rejection of a particular product. The formative evaluation provides information to a development team that specifically indicates what changes, if any, are necessary in order that the product in question may be adopted.

Formative evaluations do not normally yield judgments of acceptance or rejection of a product. It is usually assumed that the product meets curricular objectives and is concerned with enhancing the compatibility of the program to a particular audience.

General Art II And Texture

One of the products of the IDS at the MSSD is a series of six (6) units which are part of the sequence General Art II. (The Elements of Art) functions as a preparatory experience leading to offerings of a more specific nature. The emphasis is two-fold:

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1. Developing vocabulary and terminologies as they relate to the classification and evaluation of art objects, and

2. Developing a working facility with elements of art and principles of design.

The program texture 01, the subject of this report, is the first of three (3) such programs planned for the study of texture.

Texture

This unit of texture has as its stated objectives:

Terminal Performance Objective:

Given various real objects, materials, etc., the student will demonstrate his/her understanding of six basic textures by using them to describe the surface qualities of objects correctly.

Enabling Objectives:

The student will recognize two methods (visual and tactile) used to learn about texture, and name them correctly.

When asked to describe the surface quality of a given object, the student will describe the quality of the texture of the object, rather than the qualities of color, shape, etc.

Given objects which illustrate the basic textures, the student will write, sign, and fingerspell each texture correctly, describing a surface with more than one texture, if appropriate.

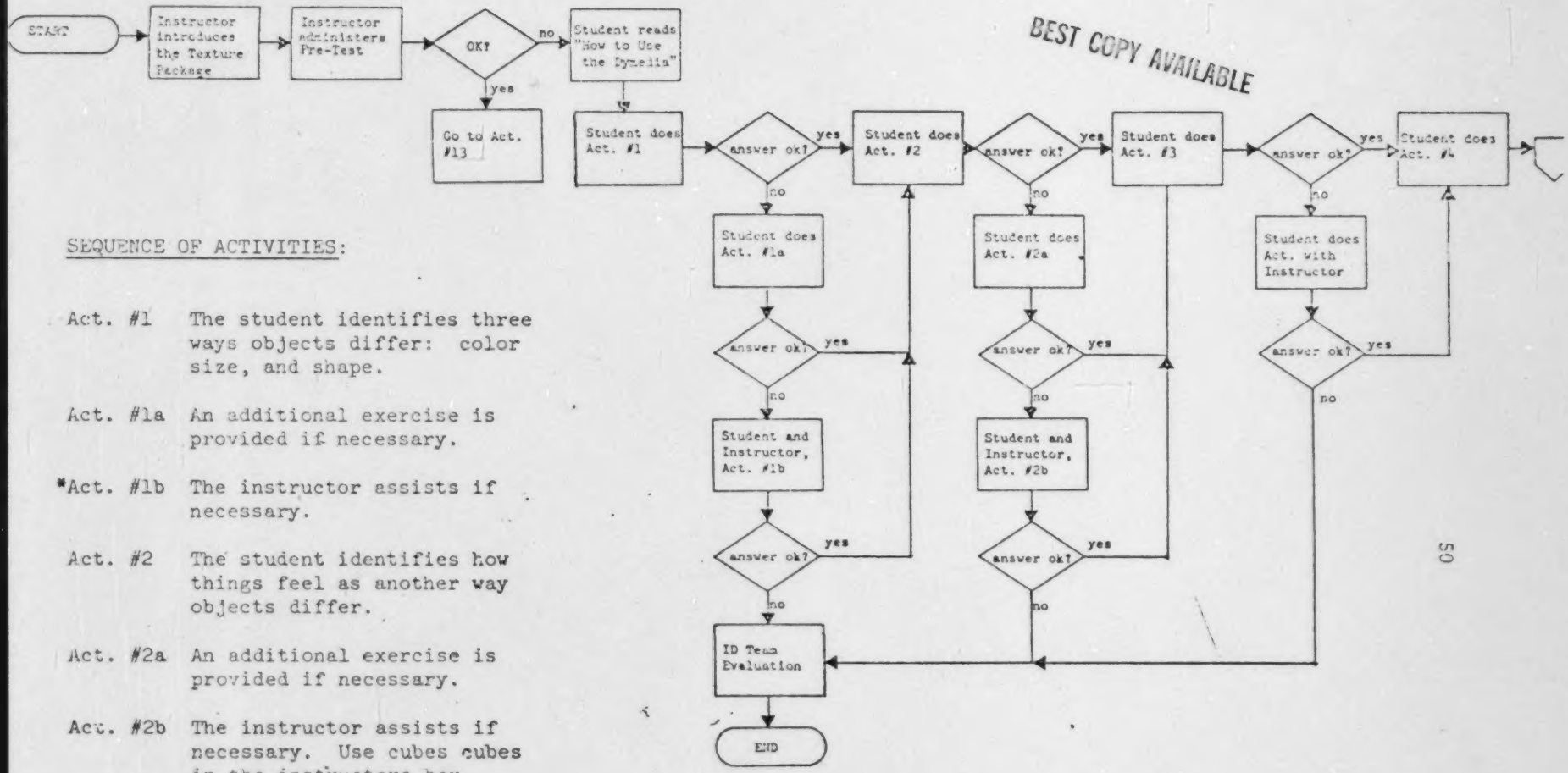
Given a list of specific textures, the student will find and photograph objects to illustrate the texture, and will label each photograph using the correct texture name.

Given photographs of objects with "highlights" marked, the student will label the "highlights" correctly.

The Instructional Sequence

The sequence of instruction for the texture package consists of a pretest, one (1) self-paced basic activities, and a posttest. Ten (10) of the basic

GENERAL ART II: TEXTURE 01



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SEQUENCE OF ACTIVITIES:

Act. #1 The student identifies three ways objects differ: color size, and shape.

Act. #1a An additional exercise is provided if necessary.

*Act. #1b The instructor assists if necessary.

Act. #2 The student identifies how things feel as another way objects differ.

Act. #2a An additional exercise is provided if necessary.

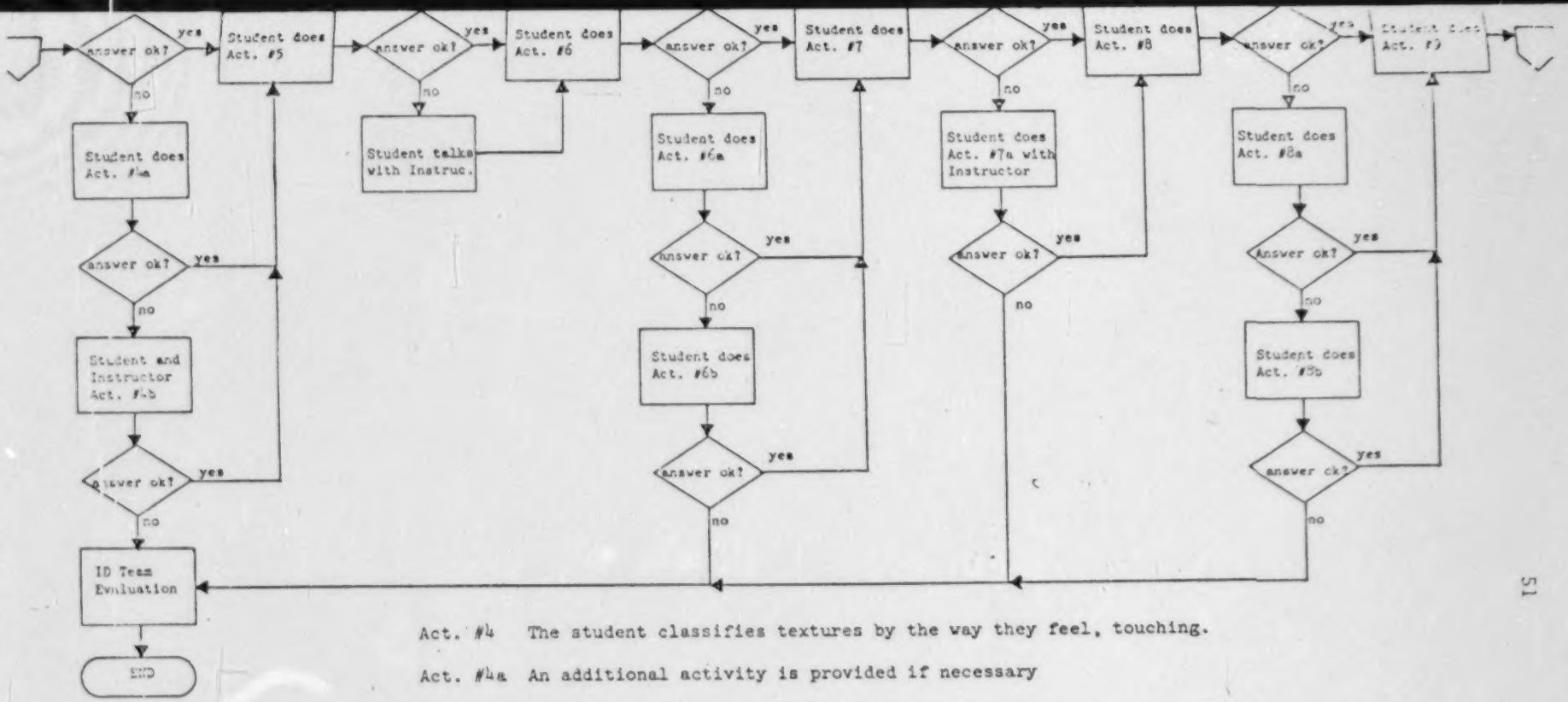
Act. #2b The instructor assists if necessary. Use cubes cubes in the instructors box.

Act. #3 The student identifies shape, size, color, and how it feels as ways objects may differ.

Act. #3a The instructor assists if necessary.

* An asterik indicates instructor participation is necessary.

Figure 1. Sequence of Activities for General Art II: Texture 01.



Act. #4 The student classifies textures by the way they feel, touching.

Act. #4a An additional activity is provided if necessary

*Act. #4b The instructor assists. Use objects in box E.

Act. #5 The student learns to find out about textures by touching and looking (tactile and visual).

*Act. #5a The instructor assists if necessary.

Act. #6 The student classifies textures by looking only.

Act. #6a The additional activity provided includes touching, if necessary.

*Act. #6b The instructor assists. Use materials from activity #6, box F.

Act. #7 The student classifies textures by looking only.

*Act. #7a The instructor assists if necessary.

Act. #8 The student names two ways to learn about texture.

Act. #8a An additional activity is provided if necessary.

*Act. #8b The instructor assists if necessary.

Continued

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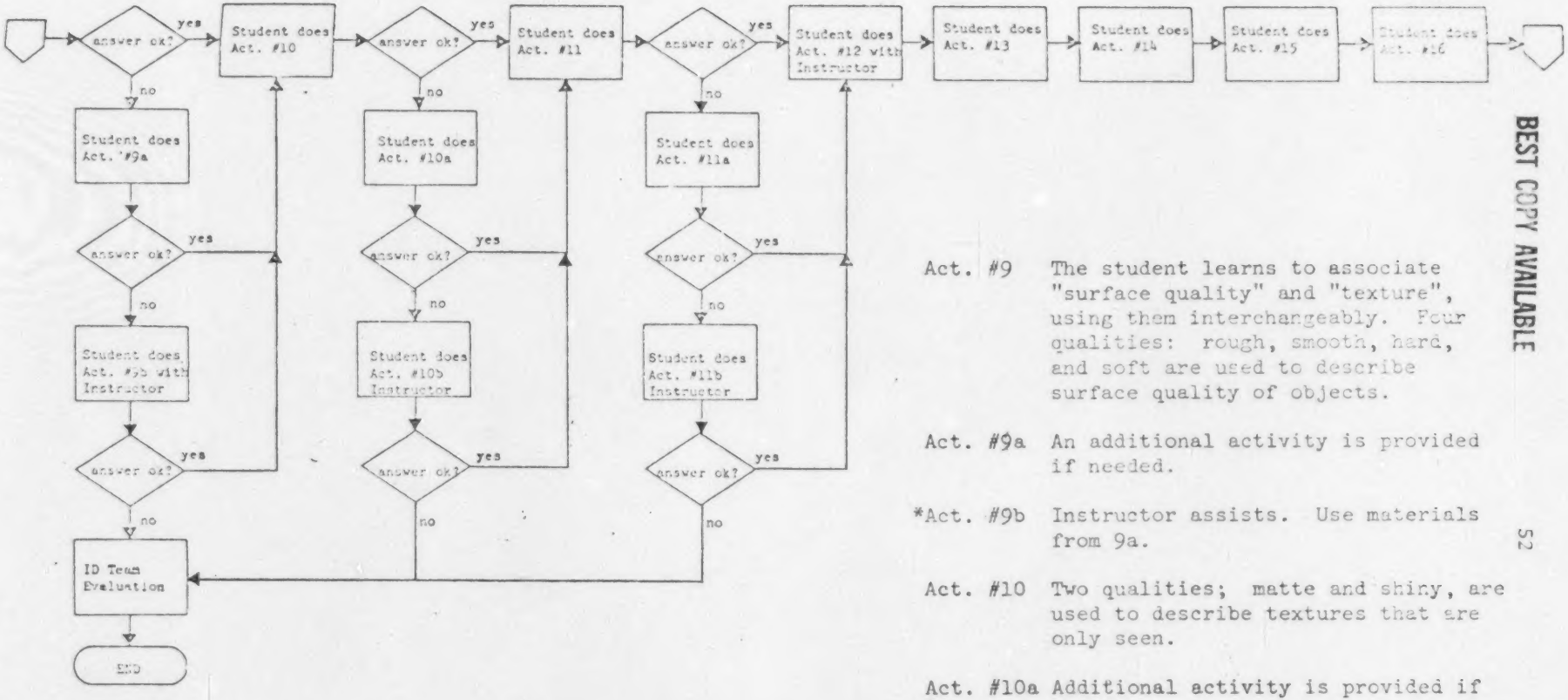

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Act. #9 The student learns to associate "surface quality" and "texture", using them interchangeably. Four qualities: rough, smooth, hard, and soft are used to describe surface quality of objects.

Act. #9a An additional activity is provided if needed.

*Act. #9b Instructor assists. Use materials from 9a.

Act. #10 Two qualities; matte and shiny, are used to describe textures that are only seen.

Act. #10a Additional activity is provided if needed.

*Act. #10b Instructor assists. Use materials from 10a.

Act. #11 The student uses six qualities to describe objects with more than one texture.

*Act. #12 Test: See the instructors manual. If necessary recycle to appropriate activities.

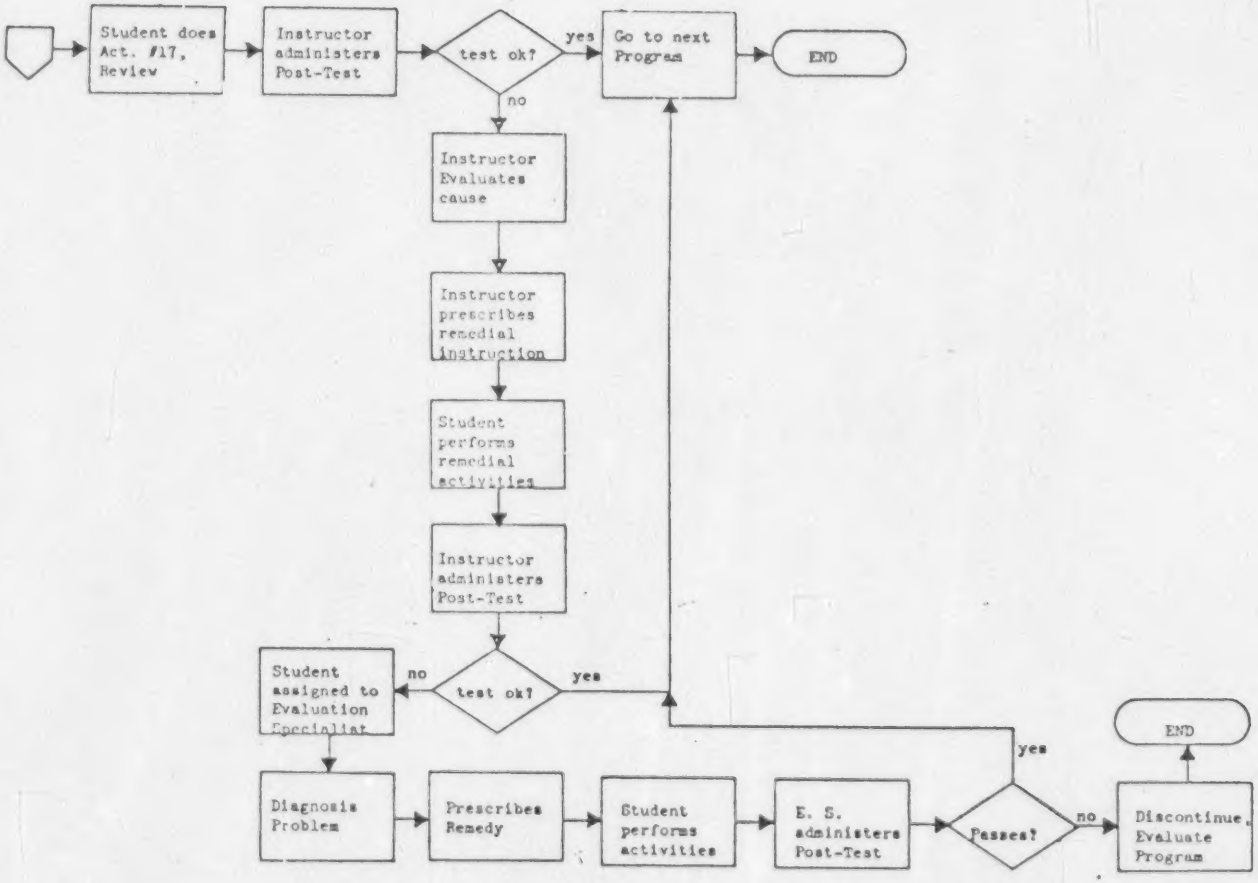
*Act. #13 The student watches segment of 16mm film, "Discovering Texture". The instructor will need to have the equipment set up in advance. Stop the film after slide #26.

*Act. #14 Check-out the student on the polaroid camera.

Act. #15 The student uses the polaroid to make photographs of textures.

Act. #16 The student assembles a booklet.

Continued



* Act. #17 The student reads the objectives again and has the opportunity to review before the Post Test. Assist by recycling to appropriate activities when such assistance is requested.

* POST TEST

continued

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activities are accompanied by supplemental (branching) activities which provide additional practice to those students requiring it.

The student proceeds at his own rate through the program. At specific points students who encounter repeated difficulties in understanding the concepts are directed to one-to-one teacher-student tuition.

Students first take a pretest and then, if they do not meet the criteria for passing the pretest, proceed through the sequence of activities.

Figure 1 illustrates the sequence of activities and a brief description of each.

Insert figure 1 about here

Instructional Modes

The student is presented with multi-modal approaches. The basic device is the printed instructional package. Packages contain exercises in both visual and tacile modes.

A monitor for student self-testing is provided through use of a mechanical response machine. The feedback device used for this program was produced by Dymedia Incorporated of Palo Alto, California. The device requires use of an IBM card, which records punched student responses. The functioning of the device is such that the student is prevented from responding to subsequent questions until the right answer has been obtained for the question or item he is working on. (NOTE: Dymedia Incorporated is no longer in existence; thus, an alternative to this particular response device will be considered.)

Real objects, prepared and introduced systematically so that learning about textures is controlled, are used by the students as learning aids. The student, for example, is supplied with three (3) cubes which clearly illustrate differences in only one (1) aspect of texture (i.e. hardness) while controlling the others (roughness and shininess).

"Supplemental" reading booklets (prepared specifically for the program), several 8 mm silent film loops and a 16 mm captioned film comprise the remaining materials used in the program. Captions for the commercially-available narrated 16 mm film were prepared by the IDS specialist and the content specialist, using a slide-sync technique.

Production delays did not allow for use of all of the required films by the students. Therefore, to-be-filmed information was presented "live", with strict adherance to the film script and information was presented without interruption (in much the same manner that a film would be viewed). The live

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presentation closely approximated, in time, the anticipated duration of the film.

As part of a final activity students are asked to use a polaroid camera to photograph objects which clearly illustrate the six (6) textures taught in this unit. The students are also asked to photograph and identify two new textures using descriptors of their own choosing. The pictures are then assembled into a labeled scrapbook compiled by the student. Each student then produces a collaged cover for their individual books.

Formative Evaluation

Formative evaluation is evaluation at intermediate stages of a program. A formative evaluation program yields data of use and importance to the development team in their efforts to modify the program as indicated and thus do not necessarily produce results of major, generalizable educational import.

Evaluation programs results, in general, should indicate that:

1. The students have learned and are learning using the materials in question.
2. There are no residual negative student reactions to the program.
3. Students work constructively toward the completion of assigned tasks.
4. The student develops an ability to express, in a medium appropriate to the context, what he has learned.
5. The atmosphere of openness and interaction during class time has been advanced.

This report will address itself to the above five (5) points.

METHOD

The Sample

The profile of the eight (8) students who were enrolled for the General Art II course is presented in table 1. The Group

---

Insert Table 1 above here

---

was selected with the following criteria in mind:

1. Consideration was given to the diversity of verbal abilities apparent in the group.

2. Problems attendent in restructuring of the class schedules of the individual students could be avoided. (Because of the small student population of the MSSD, any change in an individual student's schedules can radically affect many other classes).

Class Schedule

Class attendance was for one (1) hour, three (3) times a week, in groups of about five (5) students each. Characteristics of the schedule were such that the daily class composition was varied; that is, each student did not meet with the same group daily. Inasmuch as the program on texture was developed for individual use, the daily configuration of the class did not present negative factors for consideration.

Pretests And Posttests

The texture unit incorporates a pretest and a posttest. These yeild data of the student's cognitive experiences. The tests require the students to determine the textures of objects and write down the names of those textures. The test also requires the student to tell the instructor the names of textures of objects. The instructor records the students verbal responses.

Record Keeping

The participating teacher maintained a written daily commentary on the in-class workings of the program in her own copy of the students' instructional materials. These notes allow the teacher to recall problems encountered within the relevant context of the program. For example, words for which students asked help to understand were circled in the teacher's copy of the materials. This gives important information of specific contextual difficulties inherent in the prepared printed materials. (A student may understand the meaning of a word in one context but not recognize the same word when encountered in a different context). The teacher's copy and comments were turned over to the evaluator.

All the instructional materials consumed by the students were retained. The condition of the materials (wear and tear) serve as indicators of students' use of these items. A booklet which is worn and written in may tell more about its use than one which is clean and uncreased. (Depending, of course, on the

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Table 1. DESCRIPTION OF THE STUDENTS IN THE PILOT GROUP STANFORD ACHIEVEMENT TEST SEPTEMBER, 1973, SELECTED SUB-TEST GRADE LEVELS

Student	Sex	Word Meaning	Paragraph Meaning	Language	Test Level	Age as of Sept., 1973 (in yrs.)	Av. Hrg. loss Better Ear (in dB)
1	F	5.4	5.3	4.9	Int. II	14.9	85
2	F	5.4	5.2	6.6	Int. II	17.2	95
3	F	3.0	3.8	3.4	Int. I	16.5	92
4	M	--	4.8	6.6	Adv.	17.8	69
5	M	3.8	3.2	4.1	Int. II	16.0	105
6	M	--	6.0	5.4	Adv.	18.7	57
7	F	3.9	4.2	4.0	Int. II	16.7	95
8	M	5.5	4.6	4.4	Int. II	18.8	106+
MEANS:		4.3	4.6	4.9		17.1 yrs.	88 dB

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work habits of the student).

Student Interviews

Each of the participants was interviewed when he or she completed activity seventeen (17). Verbatium transcripts were obtained from video-taped recordings of the interview sessions. The interviews were structured to determine if students: (a) Would verbally convey acquired cognitive knowledge, and (b) Expressed any affective changes as a result of their experiences with the program.

Observation

The Instructional Design Specialist and the Content Specialist alternated, in daily direct observation of the program in operation. In general, observers were concerned with mechanical problems of implementing the program. The observations were totally passive; observers in no way intervened in the operations of the class.

RESULTS

Pretests And Posttests

The students' pretest-to-posttest gains are presented in Table 2. Posttest scores are not reported as all students attained a 100% level of accuracy on the posttest. None of the students attained criteria on the pretest. The criteria (roughly 86%) which were established for both the pretest and the posttest were:

Question 1	100%
Question 2	100%
Question 3	10 of 12 correct
Question 4	10 of 12 correct

Insert Table 2 about here

Use Of Alternate Activities

Student performance with the material was collected and analyzed to

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Table 2. STUDENT COGNITIVE GAINS AND PRETEST SCORES.
(ALL STUDENTS ATTAINED 100% SCORES ON POSTTESTS).

STUDENT	PRETEST 28 Possible		GAIN Pretest-Posttest
	Number Correct	% Correct	Percent
1	5	18%	82
2	5	18	82
3	6	21	79
4	2	7	93
5	8	29	71
6	3	11	89
7	4	14	86
8	3	11	89
MEAN	4.5	16.1%	83.9% GAIN

Table 3. UTILIZATION OF ALTERNATE ACTIVITIES BY STUDENTS IN THE PILOT GROUP

STUDENT	Alternate Activities Used
1	8a
2	none
3	4a and 9a
4	1a
5	10a
6	none
7	none
8	none

Total Alternate Activities Used	5
Total Duplications of Use	0
Total Alternate Activities Used Requiring One-to-One Instruction	0

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determine the extent to which students found it necessary to utilize the alternates to the activities provided by the program. As Table 3 indicated,

---

Insert Table 3 about here

---

students rarely found it necessary to make use of the alternate activities. None of the alternates required the one-to-one instructional mode, and there were no duplications in use.

Interviews

The verbatium transcripts of the video-taped interviews are lengthy, and are appended to this report, together with a copy of the interviewer's instructions. Analyses of the interviews include both verbal and non-verbal responses. Non-verbal responses are those which may be inferred from body movements, facial expression, etc.

When asked to name two (2) ways to learn about texture, only one (1) of the eight (8) students answered the question the first time it was asked. With some prompting, only one other student was able to answer the question with the six (6) students who did not answer the question, immediately, the question was reworded and was reintroduced at a later point during the interview. When the students were confronted with the reworded question, all six (6) supplied answers that were correct.

Four (4) students were asked to name another term for "texture". Although none could verbalize a response, there acknowledged that they did recognize the term "surface quality" when the term was provided by the interviewer.

The students were given a variety of objects (keys, rubber band, etc.) and asked to verbally identify the textures of the objects. All students identified correct texture names for the objects. Some of the responses were elicited upon various degrees of prompting. The intensity of this prompting was not high enough to be considered significant. There was sufficient indication that all the students knew the required cognitive information.

One significant non-verbal event occured during a phase of the interviews. When given a rubber band, each of the eight (8) students handled and stretched it in a manner (also evident by facial expression) indicating that they were unsure as whether to comment on the elasticity of the material. (Elasticity or Plasticity were not included in this unit as terms to be learned). One (1) student did respond with "stretchy" as a texture term but then indicated that she was "only teasing". The uncertainty of the students and stretching the band, however, are clearly evident in all taped interviews.

When questioned about reactions to the Dymedia response machine, only one (1) student expressed having had initial difficulty in using it. The problem was quickly overcome to the satisfaction of the student. All of the students expressed positive reactions to using this mode of recording responses. No student expressed any difficulty in comprehending the reading levels of the activity booklets. Four (4) students, when asked, responded that they found the booklets very easy to read.

Six (6) of the groups had had personal experience with a camera before using one in the texture program. Students who were referred to an activity booklet which explains how to use the polaroid camera found that booklet very useful.

The only negative reaction to the art class was expressed by one (1) student who stated that the use of I.P.'s (meaning written Instructional Packages) was "not art". All other responses indicated positive affective reactions to the experience.

Scrapbooks

In addition to the successful assembling of pictures of examples of the six (6) learned textures, the students were asked to photograph and name two (2) "new" textures. The terms chosen by those who responded include: Bumpy, Muddy, Fuzzy, Sharp, Prickly, and Bushy.

Completion Time

The time required for students to complete the various phases of the program is shown in Table 4.

Insert Table 4 about here

The average time required is almost 10 hours; the slowest student completed his work in 12 hours; the fastest, in seven.

Retention

The attempt was made to determine how much cognitive information the students retained over time. Two weeks after the last student completed the program, all students were given the pretest again. Table 5 displays the results of this testing. Note that after an average lapse of 35 days, the students scored better than 91% correct on retained cognitive information.

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Table 4. NUMBER OF CLASS-HOURS (IN ROUGH APPROXIMATION) REQUIRED TO COMPLETE THE ACTIVITIES OF THE TEXTURE 01 UNIT

STUDENT	Lessons 1-14	Taking Polaroid Pictures	Making Photo Album	TOTAL
1	5	3	4	12
2	5	3	3	11
3	5	3	3	11
4	4	2	3	9
5	4	2	3	9
6	3	2	2	7
7	4	2	2	8
8	5	3	3	11
MEAN	4.4	2.5	2.9	9.7

Table 5. STUDENT SCORES ON TEST FOR RETENTION OF COGNITIVE KNOWLEDGE

STUDENT	Lapse in Calendar Days since Posttest	Score on Retention Test	
		Number Correct	Percent Correct
1	52 Days	23	82%
2	35	28	100
3	21	26	93
4	52	26	93
5	33	24	86
6	52	28	100
7	12	25	89
8	25	25	89
MEAN	35.3 Days	25.6	91.5%

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Comments By Participating Teacher

Notes kept by the participating teacher relates primarily to suggestions for mechanical changes in the program and those have been submitted to the content specialist and the IDS specialist working on the program. Reactions of the participating teacher made at the conclusion of the program are extracted and presented below in the chronological order they appeared.

A. The pretest and posttest (both the same) test well and were easy to administer.

B. The use of the word "introduction" is questionable -- some of the students did not seem to understand it. (However, this does not seem to interfere with student progress otherwise).

C. Because the Dymedia machines have become obsolete, the "How To Use a Dymedia" booklets should be eliminated. The students loved to "play" with them so its use is not in question. However, it was difficult for the instructor to check each question with each student to be sure that only the correct answer was punched. One student (student 6) said he had all correct answers, on first attempts, yet several punches for items showed on his card.

With the removal of the Dymedia system, it should be quite simple to convert to the conventional format of "circle the correct answer" activity, or to find a replacement device that offers immediacy of feedback.

D. Activity #3, pages 2 and 3, (feeling other people and objects with eyes closed to emphasize different textures) should be eliminated. It was very taxing on the instructor and the kids thought it silly.

E. Activities #14 and #15 seemed to take forever, but turned out well for the students and did teach them how to use the Polaroid camera. I'm not sure if other schools will have them available (budgeting) it is a good activity but needs more brain storming. At any rate, consideration of removal of the flashbulb portion should be given. Cheap old cameras never worked properly and much film and flash material was therefore wasted. I sent everyone out-of-doors with no flash to eliminate the problem.

F. Activity #16 also took quite a bit of time, but the students enjoyed it and were most impressed with their own results.

G. In general, the entire package was "good" and showed both immediate and lasting results with the students. They all seem to enjoy learning.

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Discussion

The eight (8) students in this sample exhibited positive cognitive growth as measured by an analysis of the pretests and posttests. The tests show a mean gain of 83.9% in number of correct responses. It might appear that limited interpretation should be made of this particular statistic as the program was designed to teach a limited number of closely related terms. A high level of success might thus be expected. However, the six (6) terms (hard, soft, smooth, rough, shiny, matte) are to be used in context, assessed both visually and tactually, and subsequently reported. This task is more complex than would be initially apparent.

The students clearly demonstrated by the retention testing that they had retained the information required by the program. Admittedly, as above, there was a limited number of closely related concepts presented in the program. The complexity of identifying terms in various contexts, with multiple assessment and reporting procedures, however, significantly impinges on over reliance upon this parsimoniously-stated limitation.

The students sampled had previously used a similar program, Line. This prior exposure may account for a portion of the lack of difficulty the participants encountered in completing the program. Notations made by the participating teacher indicate that students had no difficulties with the language level of the printed portions of the program. The only word which offered any problem was the word "Braille", and that problem was easily overcome.

One indicator of the lack of language/reading problems is that the students completed the reading portion of the program in approximately the same time (Table 4), despite a wide range of reading abilities (Table 1.)

The ease with which the students proceeded through the program is further verified by the infrequent use of alternate activities (Table 3.) Only four (4) students used any alternate activities.

The use of total communication as a language medium means that much information is conveyed through body movement, facial expression, etc. Skill is required in the interpretation of these communication aspects in order that their true meaning may be discerned. In order to judge the unstated attitudes of the students the videotapes were reviewed by hearing and hearing impaired people skilled in the language of signs and finger spelling. The non-verbal communication of the students, in the opinion of the tape interpreters, clearly evidences their very positive affecting attitude toward the class experience in texture.

The discrepancy between performance on the written test and performance in the interviews may be partially due to the interviewer's inability to tally convey questions in a verbal mode understandable to the

students. The difference may also be an indication of lack of transfer, by the learner, from a written medium to verbalization. In any event, this area offers opportunity for future study.

Conclusions

The five (5) purposes of formative evaluation were satisfied:

1. Students did learn with the materials.

2. Students expressed positive reactions to the program.

3. Students worked constructively toward the completion of assigned tasks.

4. The students did develop an ability to express what was learned.

5. An atmosphere of openness and interaction during the class time was advanced.

Changes as suggested by the participating teacher have been submitted for incorporation as a revision of the program. The use of paper and pencil response modes, in lieu of the response machine, may be reliable although not necessarily desirable. If used, self-scoring answer paper should be employed.

The ease with which students encountered the materials, taking into account the large spread of their achievement test scores, indicates that a more precise determination of target population should be made, i.e., would field testing of the texture unit at an elementary level be feasible and desirable? Some of the students' achievement scores (Table 2) are similar in level to those of elementary school students.

It is the recommendation of the IDS team that, upon completion of the required changes, and upon preparation of sufficient materials, the office of Research and Evaluation should field test this program at an off-campus site.

APPENDIX

Instructions For Interviews

The purpose of the interviews is to determine if students (a) can verbally convey acquired cognitive knowledge, and (b) express any obvious affective changes as a result of their experiences in the program.

Prompting should occur only when it is evident that the student will not spontaneous generate further response. A delay of 5-7 seconds for a cognitive recall item before prompting is usually sufficient.

The interview question sequence as originally conceived is on the following page. After consultation with the developing team, a new form was prepared. It was this second form which was used with the students.

STUDENT _____

DATE _____

INTERVIEW

ASK THESE QUESTIONS OF EACH STUDENT. VIDEO-TAPE THE RESPONSES. IF THE RESPONSES DO NOT SEEM TO BE COMPLETE TO YOUR SATISFACTION, USE PROBE QUESTIONS OF THE TYPE: "THAT'S INTERESTING; CAN YOU TELL ME MORE?" DURING THE INTERVIEW GIVE NO HINT AS TO YOUR REACTION TO RESPONSES NOR INDICATION AS TO THE RIGHTNESS OR WRONGNESS OF THE RESPONSE. AT THE CONCLUSION OF THE TAPING, TRANSCRIBE THE QUESTION AND RELATED RESPONSES.

1. What did you like best when you learned about surface quality?

2. What things didn't you like when you learned about surface quality?

3. Do you remember if the booklets about surface quality were hard to read?

4. Tell me what you learned about surface quality.

5. Do you like art class?

6. If another student askes you, "What does surface quality mean?" what would you tell that student?

INTERVIEW SCHEDULE

ART--TEXTURE

Ask these questions of each student. Video-tape the responses. If the responses do not seem to be complete to your satisfaction, use careful probe questions. During the interview give no hint as to your reaction to responses nor indication as to the rightness or wrongness of the response. At the conclusion of the taping, transcribe the questions as used and the related responses.

Begin with a statement to put the discussion into context such as:

"You have just finished an art course called "texture". And then continue

? Can you tell me two ways to learn about texture?

(Expected response--visual and tactile or, touching and seeing)

? Can you tell me another name for texture?

(Expected response--surface quality)

? Here is an object. Can you tell me the texture of it?

? Can you tell me anything that you did not like about art class.

? Were the books (I.P.'s) that you used hard to read?

? Did you like to use the camera?

? Did you like to use the Dymedia machine?

? If another student asks you, "What does "texture" mean", what would you tell them?

Student 1 - Interview

? Can you tell me two ways to learn about texture?
A Soft, and hard.

? No ...
A I don't remember.

? Those are two names for textures.
A Names

? O.K., let's do another thing.
Can you tell me another name for texture?
A Another name for texture...highlights.

? No
A (Rough)

? That's "rough"
A Rough, smooth

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? Have you heard of "surface quality"?
A Surface quality - yes.

? What is the texture of that? (eraser)
A Smooth...

? And?
A Hard, and matte (spells)

? O.K. Matte. How about these? (keys)
A Shiny
Rough, Smooth

? And?
A Hard.

? How do you know that it is shiny?
A From the highlights

? What about that? (stop watch stand)
A Hard, rough, matte.

? Why is it matte?
A Not shiny.

? Why?
A Has no highlights.

? What about that? (Rubber band)
A Smooth and stretchy.

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? Is that a texture?
A Matte and soft

? Do you remember that you read some books? Were the books hard to read? Easy?
A (Between) so, so.

? So, So? Why?
A Some hard questions..like here a picture, what does it look like (comparisons)

? Did you use a camera?
A Yes

? Was it easy to use or hard?
A (So,So)

? Remember, you could read a book to show you how to use it.
A I know how, it was hard to get a picture (they were) dark or light.

? Did you get all the right pictures?
A Some are all right, some are..., most are all right. A few are wrong but, I don't care I put them in the scrap book.

? What about the dymedia machine? Did you like that?
A Yes.

? Why?
A I like to punch the key
For every number 1,2,3----
I have a choice, punch "A", it can go thru, punch the others, it can't go through
I thought it was funny.

? Is there anything that you didn't like about the art class?
A Nothing.

? If another student comes up and talks with you and says "What does the word "texture" means?" What can you tell another student?
A Look for a smooth surface, and shiny and matte and highlights or soft.

? Now can you go back again and tell me the two ways to learn about texture?
A What did you say?

? What are two ways to learn about texture?
A Seeing and feeling.

? Feeling or touching?
A Touching - (same)

? They're the same?
A No, not the same, my mistake, touching.

? You like the class?
A Yes.

Art - Texture

October 3, 1973
Tape Location - 195-440
Interviewer - W. Grant

Student 2 - Interview

? Are you finished your class about texture or are you almost finished?
A Almost. I am taking pictures now.

? Can you tell me two ways that you can learn about texture?
A Learn?

? Do you know two ways to learn about texture?
A Two ways?
? Two ways.
A Seeing?

? Right.
A And feeling.

? Feeling?
A Touching.

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? Touching?
A Touching.

? Can you tell me the texture of that? 9eraser)
A Matte...

? And?
A Hard and smooth.

? Fine. Try these (keys)
A Shiny.

? How do you know that it is shiny?
A (Shiny) do you understand me?

? I understand you. What do you look for to know if something is shiny?
A -----

? What else...
A Hard, rough.

? What do shiny things have?
A Spot lights.

? Highlights?
A Right.

? What about this? (rubber band)
A Soft...

? And?
A Matte and rough.

? Rough? Does that feel rough?
A When you twist it.

? When you twist it.
A When you twist it, it is rough, but like that (loose) it is smooth.

? Do you remember that you had to read some books?
A Yes.

? Were they easy to read?
A (Yes)

? What about the dymedia machine? Did you like that?
A (Fine)

? Why?
A Because it helps me learn, that's why.

? Did you know how to use the camera before?
A I have never used the polaroid.

? You never used one like that before?
A But now, I am using it now.

? Did the book help you know how to use that?
A Yes.

? If another student comes up to you and says, "What does the word texture mean?" Can you tell them what the word texture means?
A Texture means, How you touch and see: like describing what you see and touch.

? Is there anything that you didn't like about the texture class?
A Anything?

? Anything.
A No.

? You liked it all?
A (Yes)

? Did you get the problem about the teacher helping you solved?
A Sometimes Fifi---I'm first, I ask: she starts to get the paper and then another student gets her and that makes me mad because I will be waiting for a long time.

? Do you tell the teacher that you are mad?
A (Yes)

? And what does the teacher say?
A She was saying that she will try in the future to do a better job.

Art - Texture

October 31, 1973
Tape Location - 620-684
Interviewer - W. Grant

Student 3 - Interview

? Have you finished your course "Texture"
A (Right)

? Can you tell me two ways to learn about texture?
A (Texture)

? Two ways to learn about texture?
A (Texture) (I don't know)

? Can you tell me another name for texture?
A Rough - What did you say?

? That's the name of a texture.
Can you tell me another name for texture?
A (Rough)

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? Do you remember the name "Surface Quality"?
A Surface (Yes)

? Can you tell me the texture of that? (eraser)
A Smooth, soft, M-A-T-T

? (What?)
A M-A-T-T-E

? Right. What about that? (rubber band)
A Matte, smooth, soft

? OK, what about that? (Key)
A Matte

? Matte?
A Yes, hard, smooth

? Is that shiny?
A Not shiny

? It's not? How do you know if something is shiny?
A (Turns Keys) Oh - light (shows on key)

? What is the name for that?
A Surface

? What do you look for to see if something is shiny?
A (Shows key)

? What is that called?
A Shiny

? H-I-G-H-
A Highlights

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? Highlights
Is there anything that you didn't like about the art class this time?
A - -

? Did you like it all? Was it OK?
A OK (When I first started Art I thought it was all drawing, now I find that is many things)

? Before you come to the class did you know how to use the camera?
A Know how before

? Where did you learn that before?
A CORE

? Ok, in the CORE program
Did you finish all of your pictures?
A (Yes)

? Did you get them all right?
A (yes)

? If another student ask you what the word "texture" means....
A Surface -- Right?
(Forget it)

? Did you like to use the Dymedia machine?
Remember you pushed the buttons, was that easy to use?
A Hard, I didn't know how.

? Do you know how now?
A (Yes)

? Can you find out about texture by touching or seeing?
A Seeing or touching.

? That's two ways....
A Two ways.

? To learn about texture, right?
A (Yes) Can see if shiny, can touch if rough, can see if fuzzy-can see if not same.

? Anything else?
A Can see if the light (makes) highlights is not, not same as shiny, then matte.

Student 4 - Interview

? You are working on texture.
A Right

? Can you tell me two ways to learn about texture?
A Shiny?

? No, let's come back to that.
Do you know all the textures?
A Six?

? Yes, what is the texture of that (eraser)
A Smooth.

? And?
A Matte

? And?
A Hard

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? What about that? (rubber band)
A Matte, soft, and rubber.

? Is that the name of a texture?
A Soft, matte and smooth.

? What about that? (keys)
A Hard and shiny
(Shows shiny)

? What is that called?
A Highlights.

? And
A (Mixture) of smooth and rough.

? You said before that the books in the Line course were very easy to read.
A (Yes)

? What about the books in the texture class? Were they very easy?
A (Yes)

? Too easy?
A Same

? What about the dymedia machine?
Was that easy to use?
A (Yes)

? Did you like it?
A Enjoyed it.

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? Did you finish your pictures?
A (Yes)

? Did you know how to use the camera before?
A (Yes) But not that kind of camera.

? You never used that kind of camera before?
A (No)

? Did the book about the camera help you learn how to use the camera?
A (Yes)

? If another student asked you, "what does the word texture mean?" What would you say?
A Oh, tell them texture is feeling...

? Or?
A Visual, seeing, looking.

? That's two ways to learn about texture, right?
A Yes.

? Is there anything you don't like about the art class now?
A Nothing, I told you before.

? I am trying to be sure that you still like it.
A I told you that clay is not my favorite.

? But the texture is O.K.?
A O.K.

? Anything else?
A Else?--- I call you a nosey man.

Art - Texture

October 4, 1973
Tape Location - 505-575
Interviewer - W. Grant

Student 5 - Interview

? You have just finished an art class about texture. Can you tell me two ways to learn about texture?
A Two ways? Rough and smooth.

? No, those are names, two ways to learn about texture?
A T-E-X-T-U-R-E

? How do you know about the texture of something?
A -------

? O.K., we will do that later. Do you know the names of all the textures?
A (Yes)

? Can you tell me the texture of that? (eraser)
A Smooth and soft and...

? And?
A Matte

? And what about this one? (Keys)
A Hard and shiny.

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? Shiny? How so you know that it is shiny?
A (It has) highlights.
and rough and smooth

? What about this one? (rubber band)
A Soft, matte, smooth.

? Fine. Remember you had to read some books, were they hard to read?
A O.K. half.

? What about the machine? You used a machine called a dymedia. Was that hard...
A Easy.

? Did you like to use that?
A O.K.

? Did you use a camera?
A Yes

? Did you know how to use that camera before?
A Yes

? If another student comes up to you and talks with you about texture, can you tell him what the word "texture" means?
A A student thought I was playing with the camera. I told him it was for class. I was trying to get texture for my class. The other student left.

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? What does the word "texture" mean?
A Means different things, smooth, soft, hard, rough, shiny and matte.

? It means how something looks...
A Looks, yes.

? And
A Feels

? Two ways to learn about texture are how something looks and feels.
A (Yes)

? Were there any problems with class?
A (No)

? It was a fine class?
A Yes, alright.

? The teacher was helpful.
A But sometimes, I (had to) wait, I wait for the teacher because the teacher helped the other students.

? Did you have to wait too long sometimes?
A Ten minutes.

? Ten minutes? Wow!
A Wait, wait, wait.

? Did you tell the teacher?
A Wait, say "help me"
help me understand more
then the teacher helps me.

Art - Texture

October 4, 1973
Tape Location - 575-630
Interviewer - W. Grant

Student 6 - Interview

? I need to ask you some questions about textures. Can you tell me two ways to learn about textures?
A Visual and feeling.

? Feeling or touching?
A (Touching)

? Can you remember all the names of textures?
A (Yes)

? I am just asking because I want you to tell me the texture of that (eraser).
A Soft and smooth...

? And?
A Matte

? What about that? (keys)
A Highlights.

? What does that mean?
A Shiny, hard and rough.

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? What about this one? (rubber band)
A Soft, smooth and...

? And?
A (I forgot) matte, too.

? We would like to know how you feel about using the dymedia. Was that a good way to learn or not or it doesn't matter?
A (I think) OK.

? Have you finished using the camera?
Did you get all your pictures?
A (Yes)

? Did you get them all right?
A (Yes)

? The camera was easy to use?
A First I made some mistakes, but then it was Ok.

? But there is a book to help you do that.
A Yes

? Can you tell me what the word texture means?
A Texture?

? Yes, what does it mean?
What does the word itself mean?
A It means to feel what it looks like.

? To feel what it looks like?
A I mean both.

? You mean both what it feels like and what it looks like?
A Yes

? How was the class? OK?
A OK
too regular

? Too regular, why? Not enough variety?
A But the class is different all the time.

? It's different all the time.

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Art - Texture

November 1, 1973
Tape Location - 684-741
Interviewer - W. Grant

Student 7 - Interview

? You learned about textures, right?
A Yes

? Do you know all the names of the textures?
A Yes

? Can you tell me two ways to learn about textures?
A (?)

? Two ways to learn about texture?
A ---

? O.K., Can you tell me another name for texture?
A Smooth

? That's the name of a texture. What is another name for texture?
A T-E-X?

? Do you remember the name "Surface Quality"?
A (Yes)

? Can you tell me the texture of that? (eraser)
A Matte, smooth, hard.

? What about that? (Keys)
A (Shiny) Highlights, hard, smooth.

? What about that? (rubber band)
A Matte, soft, smooth.

? Did you use a dymedia machine?
A (?)

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? A Dymedia machine.
A Yes

? Was it hard to use?
A No

? It was OK?
A Yes a good one

? Did you finish your pictures?
A Yes

? Did you get them all finished?
A Yes

? Did you get them all right?
A All but two.

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? Why?
A The two pictures, when I first took the pictures with the camera I made mistakes, I couldn't get the highlights. The second time I tried, perfect.

? Is there anything now that you don't like about the art class?
A Always working on IP's.

? You don't like that?
A Since I came I am still reading, that's art?

? Can you learn about textures by seeing and touching?
A (Yes)

? Is that two ways to learn about textures---by seeing and touching?
A Right.

? When you read the books, were they hard?
A (No)

? Were they easy?
A Easy.

? Too easy?
A Yes

Student 8 - Interview

? You just finished a class about texture.
A (Texture) I don't understand --- I am teasing you.

? Can you tell me two ways to learn about texture?
A Two ways?

? How can you learn about texture?
A Two ways? I forgot.

? Can you tell me another name for texture?
A Another name? Hard?

? No
A Other?

? Do you remember the name "surface quality"?
A No

? Well, maybe you didn't see it before. Can you tell me the texture of that? (eraser)
A Hard,...

? And?
A Smooth--and 1 more?

? Try one more.
A Smooth, hard and matte.

? What about that? (Stop Watch Stand)
A Hard, matte, rough.

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? What about that? (rubber band)
A Smooth, matte...
? O.K. and?
A Soft

? You had to read some books. Were they hard to read?
A (No)

? Very Easy?
A I agree, very easy.

? What about the dymedia machine, was that hard to use?
A -----

? The dymedia machine.
A Very easy, I understand, push button, easy.

? Why?
A It was easy, push the button, check the question, got them all right, easy.

? Did you finish with the camera?
A Not yet.

? Did you know how to use the camera before?
A Very easy, yes, last year in Science I used the camera, they were the same.

? If another student asks you "What does the word texture mean?" What can you say?
A What does texture mean?

? Yes
A See, feel.

? Right.
A Again, your question?

? What does the word texture mean?
A T-E-X-T-U-R-E?

? What does it mean?
A Look, or feel.

? Now we will go back again, what are the two ways to learn about texture?
A Feeling and seeing - Dumb me.

? Is there anything that you don't like about the art class?
A The art class now?

? Is it still O.K.?
A Yes, I like art.

? Is it boring sometimes?
A No